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Before the
Federal Communications Commission
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Replacement of Part 90 by Part 88 to)
Revise the Private Land Mobile Radio)

PR Docket No. 92-235

TABLE OF CONTENTS

	Page
I. Proposed Changes in the 72-76 MHz Band.....	2
II. Impact of the Proposal	3
A. Implementation Of The Proposed Rules At This Time Will Undermine The Reliability Of Radio Control Devices.....	4
B. Implementation Of The Proposed Rules At This Time Will Cause Steep Price Increases For Radio Control Equipment	6
C. Implementation Of The Proposed Rules At This Time Will Have A Substantial Adverse Impact on the Radio Control Industry.....	7
III. Modifications in The Proposed Rules Would Better Serve the Commission's Goals	9
A. The Commission Should Establish Radio Control Users as Primary Users.....	10
B. The Commission Should Modify Its Proposal For The 72-76 MHz Bands	10
IV. Conclusion	12

Attachment A

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Replacement of Part 90 by Part 88 to)
Revise the Private Land Mobile Radio) PR Docket No. 92-235
Services and Modify the Policies)
Governing Them)

**COMMENTS OF
THE RADIO CONTROL MANUFACTURERS ASSOCIATION**

Pursuant to the Notice of Proposed Rulemaking¹ and order² released November 6, 1992 and February 9, 1993 respectively, the Radio Control Manufacturers Association ("RCMA") hereby submits these comments in the above-captioned proceeding.

The RCMA represents the interests of 20 companies that manufacture or import radio-frequency equipment in the United States for the radio control hobby industry. Its members include both large and small businesses, with annual wholesale sales of such equipment of up to \$40 million. The devices manufactured or imported by the RCMA's members are used to control model aircraft (airplanes and helicopters) and surface craft (cars and boats).

The NPRM represents an important step in the modernization of the private land mobile radio spectrum. Its goals are not controversial: to

¹ Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them, Notice of Proposed Rulemaking, 7 FCC Rcd 8105 (1992) ("NPRM").

² Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them, Order Extending Comment and Reply Comment Periods, 8 FCC Rcd 1501 (1993).

increase the channel capacity in the bands below 512 MHz, encourage the use of more efficient technology within these channels, and simplify and modify the current private land mobile radio rules. In short, the Commission proposes to "develop[] modern rules to support future technologies." NPRM at ¶¶ 1, 4.

The RCMA's members do not question these goals but suggest that the Commission may have based some portions of its proposed rules on unwarranted assumptions about their likely effects. In particular, we believe that the proposed sharp reductions in bandwidth and channel spacing requirements in the 72-76 MHz band will cause significant harm to the radio control industry.

We believe that these frequency bands should not be subject to "re-farming." If the Commission determines that such changes are necessary, however, we request that the Commission follow the lead of Japan and the European countries and dedicate spectrum -- whether in the 72-76 MHz bands or elsewhere -- to radio control use. Finally, if neither of these solutions is possible, the RCMA urges the Commission to mitigate the adverse impact on its members increasing channel spacing to 7.5 kHz, phasing in the new requirement over a longer period of time and taking other steps to make more efficient use of the 72-76 MHz bands in the interim.

I. Proposed Changes in the 72-76 MHz Band

The Commission proposes ultimately to reduce channel spacing from 20 kHz to 5 kHz and to decrease bandwidth size to 5 kHz. 47 C.F.R. 90.257; NPRM, Appendix D § 88.1501. These reductions in channel spacing and bandwidth would be accomplished in stages.

First, the Commission would impose new bandwidth and channel spacing requirements on all new users beginning upon the adoption of the new rules. Under the proposal, new users would be licensed 20 kHz of bandwidth for

fixed operations and 4 kHz for mobile operations. NPRM, Appendix D § 88.413(b)(6). In addition, channel spacing would be reduced to 20 kHz for fixed operations and 5 kHz for mobile operations. Id.

The second stage would target existing users, who would be required to minimize transmitter channel deviation and conform to a bandwidth of 20 kHz for fixed operations and 10 kHz for mobile operations. This must be accomplished by January 1, 1996. Beginning at that time, new users would be slotted between existing users, within 5 kHz of channels currently used for radio control devices. NPRM, Appendix D § 88.413(b)(6). By minimizing channel deviation, thereby eliminating much of the "noise" produced by existing users' systems, the proposal seeks to ease the way toward the addition of new channels in a manner that is minimally disruptive and costly for incumbent users. Minimizing the permissible channel deviation will reduce current users' effective bandwidth -- thereby creating more space for new channels -- without compelling incumbent users to purchase new equipment. As discussed below, the required reductions in channel spacing and bandwidth *will* compel users to purchase new equipment.

Finally, the Commission would require existing users to switch to new narrowband equipment. All users would be required to convert to 5 kHz channels beginning in 2004 and ending in 2012, depending the user's geographic market. NPRM, Appendix A at 13; Appendix D § 88.413(b)(6); Appendix D § 88.433(d).

II. Impact of the Proposal

The proposed rules would govern the primary users in the 72-76 MHz band. Between these primary users, however, 80 frequencies are allocated

for use by radio control hobby devices operating as secondary users. As the new rules are phased in, the spacing between primary and secondary user channels will decrease. While 10 kHz will remain between fixed operations and these secondary users, mobile users will be given frequencies only 2.5 kHz away from those currently designated for use by radio control devices. This "squeeze" on secondary users would have a substantial adverse impact on radio control devices in terms of both reliability and cost. The adverse effects on the radio control industry -- including manufacturers and "downstream" entities like distributors and retail operations -- would be similarly substantial and adverse.

A. Implementation Of The Proposed Rules At
This Time Will Undermine The Reliability Of
Radio Control Devices.

According to the Commission's rules, users of radio control devices are secondary users and "must accept interference from any other operation." NPRM, Appendix D § 88.907; 47 C.F.R. 95.207. Despite this, users of radio control devices have historically relied on secure spectrum that is, for all practical purposes, free of harmful interference. This has been true despite the very low power levels at which radio control devices operate relative to the power levels employed by primary users in the 72-76 MHz band. Although the Commission's rules permit radio control transmitters to operate at .75 W,³ in practice, most transmitters operate at only .5 W for aircraft models and at .03 W for surface models. This is less than half the power employed by mobile users,⁴ who can easily drown out the signals of radio control devices

³ 47 C.F.R. § 95.210(a)

⁴ 47 C.F.R. § 90.257(b)(2).

operating in nearby -- or, as the Commission's proposal would permit, overlapping -- frequency bands.

This disparity in power poses little problem today because current Commission rules provide sufficient space between channels. All users have the security of knowing that no other user (primary or secondary) is close enough to cause interference. However, the addition of mobile operations only 2.5 kHz away from the radio control user frequencies will inevitably subject radio control users to interference from mobile users. The risk is amplified enormously by the fact that the new channels for mobile operations will be allowed to operate at a frequency stability of up to 50 ppm. NPRM, Appendix D § 88.425(a), Table C-2. Because of this inexplicably slack rule, primary users' signals will be permitted to drift up to 3.6 kHz, well over the boundary of the 2.5 kHz separating them from secondary users. By comparison, radio control devices operate at a frequency stability of 20 ppm. We see no technical impediment to holding the primary users to the same standard.

Contrary to the Commission's assumptions, radio control users do not always operate in large remote fields, and new mobile licensees are not always confined to factories, corporate campuses or other contained environments. Radio control devices are used on large fields by aeronautical clubs, but aircraft and surface models are also operated in residential neighborhoods, parks, schoolyards, parking lots, warehouse lots and other spacious (but not necessarily remote) areas. For their part, the new mobile uses will be available for General Services, a category that includes public safety, non-commercial, and specialized mobile radio services. NPRM, Appendix D §§ 88.21, 88.1501. It is much more likely than not that these mobile services will be operated in sufficiently close proximity to radio control devices to cause the latter to fail -- which will cause a loss to the owner of a device costing up to

hundreds of dollars, and may well also cause property damage and personal injury.

B. Implementation Of The Proposed Rules At
This Time Will Cause Steep Price Increases
For Radio Control Equipment.

Reliability is in part a financial matter, insofar as consumers will likely balk at purchasing replacement devices or absorbing the costs of damage done by plummeting airplanes or wayward cars and boats. The larger financial impact of the Commission's proposal, however, is on the cost of redesigning the receivers and transmitters themselves to comply with the new bandwidth and channel spacing requirements. Manufacturers cannot at this time predict for certain what the re-designed receivers and transmitters will cost, but we estimate that the cost of new receivers will double or triple and that the size and weight of the devices will likely increase by a similar factor. As research and development activities yield more precise information, the RCMA will provide it to the Commission in this docket.

It is important to note that the phase-in of the proposed rules will be very different from that required by the FCC in 1991. The Commission's 1991 decision required radio control transmitters operating in the 72-76 MHz band to reduce the level of radiation emitted and improve frequency stability.⁵ By March 1992, manufacturers were required to develop new transmitters; existing stocks of old transmitters could still be sold for an additional year.⁶ As of March

⁵ Amendment of Part 95 of the Rules regarding the technical standards for transmitters operating in the 72-75 MHz band in the Radio Control (R/C) Radio Service, Report and Order, 6 FCC Rcd 1975 (1991) ("1991 Report and Order").

⁶ Id. at 1976.

1993, only equipment meeting the new standards could be sold. In addition, users who owned the old transmitters were allowed to continue using their equipment until March 1, 1998. Compliance with the new rules was not difficult; indeed models meeting the standards had been on the market since January 1988. In practice, then, the decision did not make existing equipment obsolete for 10 years.⁷

Unfortunately, the transition contemplated by the rules proposed here promises to be far more disruptive and produce far more adverse effects on the radio control industry than the phase-in of the Commission's 1991 rules change.

C. Implementation Of The Proposed Rules At This Time Will Have A Substantial Adverse Impact on the Radio Control Industry.

There is no question that the manufacturers of radio control devices will do whatever is necessary to comply with the rules the Commission ultimately adopts. The unknown factor, however, is how consumers will respond -- an issue to which the Commission should attend.⁸ The RCMA's members believe that implementation of the proposed rules will result in considerable consumer resistance, which will do immeasurable damage to the radio control industry.

As explained above, the technical changes necessitated by the proposal are not insignificant. RCMA's members have closely examined the

⁷ Id. at 1976.

⁸ As participants in an informal "brownbag" lunch meeting with Private Radio Bureau staff on March 1, 1993 noted, consumers will certainly weigh considerations of cost, size and safety against the benefits of any new technology. The Commission should factor the likely behavior of consumers into its deliberations on this matter.

proposal and explored the modifications they would have to implement to comply with the new bandwidth and channel spacing requirements -- and have concluded that they will be unable within the near-term to bring to market new radio devices that are comparable in convenience and price to what consumers enjoy today.⁹

We believe that the delay in making the new devices available will cause consumers to delay or forego purchases until such time as the technology (and price) improve. This conclusion is bolstered by the fact that these devices have a relatively long useful life.¹⁰ The substantial investments that advanced hobbyists make in their equipment also suggest that this concern is well-founded.¹¹ And the hobbyists themselves have confirmed this conclusion in comments -- both formal and informal -- filed in this proceeding.¹²

⁹ In suburban Washington, DC, a typical model airplane kit (including the model, engine, fuel and radio) costs anywhere from \$450.00 to a few thousand dollars. A beginner can spend as little as \$100.00 for the plane and engine and \$175.00 for a 6-channel radio. See Paul McHugh, "These Speedy Planes Are Model Fliers -- Miniature Craft Take Skill to Build and Pilot," San Francisco Chronicle, Oct. 7, 1991, at C10 (citing an average price of \$250.00 for a beginner kit, including \$145.00 for the radio control device). Because the radio represents as much as half of the total price of any radio controlled model, there is likely to be considerable "sticker shock" when the redesigned devices are released.

¹⁰ Hobbyists often use their models for 5 years, and 10-year-old models are not uncommon.

¹¹ Advanced hobbyists may make substantial investments in their equipment, modeling planes on those used during World Wars I and II or on modern military or civilian aircraft. Models range from World War I ace Baron von Richthoffen's Albatross to a civilian Beechcraft Skipper trainer to an Israeli Kefir jet. These replicas weigh up to 20 pounds, are built up to one-third the size of the original aircraft, have wingspans of 6 to 10 feet and can fly up to 100 mph. The ultimate goal is to build a model that will perform the same maneuvers as the original. Obviously, as the size, design details and maneuverability increase, so does the consumer investment. For sophisticated models, the radio control panel alone can cost up to \$1,000.00. Paul McHugh, "These Speedy Planes Are Model Fliers -- Miniature Craft Take Skill to Build and Pilot," San Francisco Chronicle, Oct. 7, 1991, at C10.

¹² Comments of The Academy of Model Aeronautics, Docket No. 92-235, filed March 10, 1993; Reply Comments of The New Hampshire Flying Tigers, Docket No. 92-235, filed May 4, 1993 (refuting the Commission's assessment of the repercussions of the proposed rules on the radio control industry); numerous letters from hobbyists as well as letters from U.S. and State Senators and Representatives on behalf of the hobbyists.

We note in this regard that the instant proposal poses problems very different from those faced by the radio control industry in the transition to narrowband equipment undertaken in response to the Commission's 1991 Report and Order. As explained above, the technical changes necessitated by those rules were relatively simple to implement, and manufacturers were able to bring the redesigned devices to market quickly and at no cost increase to consumers.¹³ The level of consumer acceptance of the redesigned equipment was therefore high, and the grandfathering of existing equipment made the transition even smoother.¹⁴

The factors described in the preceding Section will make the transition under the proposed rules very different indeed, and some segments of the radio control industry -- broadly construed to include manufacturers, distributors and retailers -- may not survive a protracted hiatus in consumer activity that is likely to result from implementation of the proposed rules.

III. Modifications in the Proposed Rules Would Better
Serve the Commission's Goals.

As stated above, the DCA supports the Commission's goal of

A. The Commission Should Establish Radio Control Users as Primary Users

The principal problem with the Commission's proposal is, as explained above, that it seeks to crowd users with essentially conflicting needs into what are already crowded frequency ranges. RCMA suggests that the Commission consider an alternative that is increasingly being used in Japan and Europe -- dedicating spectrum to radio control use.¹⁵

The RCMA's members believe that the technical changes to accomplish a move to a new frequency would bring a new product to the market quickly, at lower cost and lighter weight than the changes that would be necessitated by the Commission's proposal. If the channel spacing in the new frequency range were the same as the current 20 kHz, all that would be required would be a frequency change. A major re-design of the equipment would be unnecessary. We that this alternative be given serious consideration and would be willing to work with the Commission's staff to identify alternative frequencies that might provide a permanent "home" for radio control users.

B. The Commission Should Modify Its Proposal For The 72-76 MHz Bands

In particular, the Commission should focus any "re-farming" efforts on the 72 MHz band, leaving the 75 MHz band in its current state, *i.e.*, off limits to mobile users. We suggest this distinction because the latter band is where users operate lower-cost surface equipment. The users of this equipment tend

¹⁵ Japan has treated radio control as primary users in the 40 MHz band for many years and recently dedicated an additional frequencies at 72MHz for that purpose.

to be novices, and any substantial price increase in models operated in that band would be most keenly felt.

Second, the Commission should insert channels in the 72 MHz band at no less than 7.5 kHz spacing from the radio control frequencies, which should themselves be designated primary users of those frequencies. Attachment A to these comments sets out how this channel spacing proposal would work.

Third, the Commission should lengthen the phase-in period for new devices. This will facilitate the development of technical solutions that, we hope, will yield radio control devices as safe, convenient and cost efficient as the devices in use today. We believe that by 2004, radio manufacturers can have on the market reasonably-priced equipment that will operate reliably at 7.5 kHz channel spacing. In order to ensure a smooth transition, we urge that existing equipment be grandfathered (*i.e.*, not rendered obsolete) until 2010.

In the interim, the Commission should reduce the channel deviation requirements for all primary users in the 72-76 MHz band. There appears to be no valid reason to permit the loose standard of 50 ppm. In addition, if the Commission finds it necessary to slot mobile frequencies in close proximity to the radio hobby frequencies prior to the widespread deployment of new radio control device equipment, the Commission should restrict their use to low-power mobile applications confined to recognizable locales, *e.g.*, factories, campuses or other contained settings.

Finally, the RCMA urges the Commission to issue a consumer advisory or similar notice to the public summarizing its final ruling on this issue. The RCMA's members (as well, we think it safe to assume, as distributors and retailers of radio control devices) are concerned that consumer confusion on these issues will itself cause permanent damage to our industry.

IV. Conclusion

The Commission faces a considerable challenge in ensuring the most efficient use of the increasingly scarce resource represented by our radio spectrum. In reviewing and modernizing its rules, the Commission should be mindful not only of the jigsaw puzzle aspect of the challenge but of the impact of its decisions on the broad range of users. Hobbyists are only one of many classes of users who rely on safe and cost-efficient radio control devices. Other users include:

the United States military, which uses radio control devices to fly remote piloted aircraft on reconnaissance and bomb-sighting missions.¹⁶

school systems, which encourage the use of radio control devices by students for use in classroom experiments, fairs and competitions.¹⁷

automobile manufacturers, which use radio control devices to test the safety of new cars. Remote powered cars are used to recreate possible accident situations to confirm the car's safety features comply with national standards.

the motion picture industry, which uses radio control devices to create special effects used in feature films.

¹⁶ During Operation Desert Storm, remotely piloted aircraft were used from battleships to monitor troop movements along the Saudi-Kuwaiti border. Each aircraft was equipped with enhanced cameras that recorded troop movements or spotted targets. Janice L. Jones, "Neighborhood Profile: Mile Square Park Area," Los Angeles Times, Mar. 15, 1991, at E2. Many members of radio control clubs are military personnel who train for or run these missions.

¹⁷ Most high school students who become radio control hobbyists or undertake experiments using radio control devices pursue this interest as adults. Many become professionals in the aerodynamics industry, including engineers, pilots and other military personnel, and astronauts. Among the more famous are Neil A. Armstrong; Robert "Hoot" Gibson, NASA, Commander, U.S. Navy, Pilot & Commander, U.S. Shuttle Missions; C.D. Dean, Lieutenant General, U.S. Marine Corps.

utility companies, research laboratories and archeologists, which use radio control devices for air-to-ground photography.

To this end, the RCMA urges the Commission to adopt the recommendations set out above for bandwidth and channel spacing requirements in the 72-76 MHz band and to rely on other measures suggested herein to advance its goals in the interim.

Respectfully submitted,

A handwritten signature in cursive script, reading "Ellen G. Block".

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CERTIFICATE OF SERVICE


I, Ellen G. Block, hereby certify that true and correct copies of the foregoing Comments were served by hand-delivery or first class mail, postage prepaid, on this 28th day of May, 1993 upon the following parties:

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